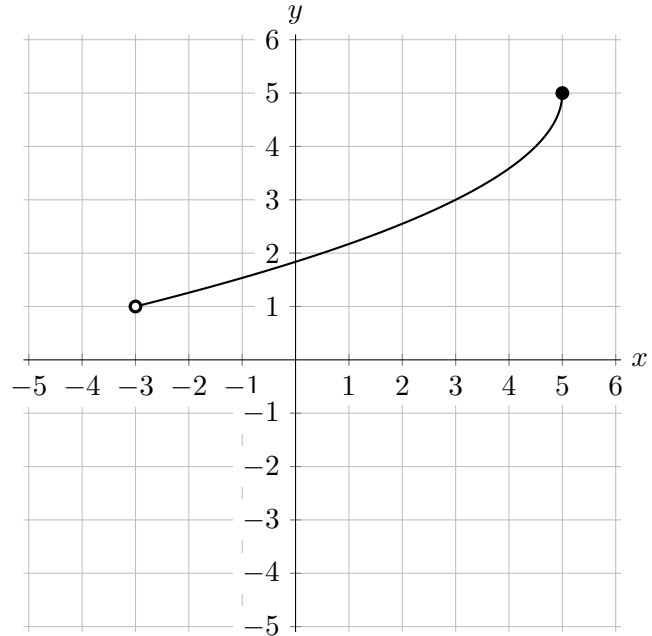


4. [5 points] Given below is the graph of a function  $B(x)$ . Briefly explain how you can tell that the function  $B(x)$  is invertible. Then, on the same set of axes, carefully sketch the graph of  $B^{-1}(x)$ .

**Explanation:**



5. [7 points] Suppose that  $a(x) = mx + b$  for some constants  $m$  and  $b$ , where both  $m$  and  $b$  are not equal to zero.

In parts **a.** and **b.**, decide whether each of the following statements must be true, or whether it could be false, and circle the appropriate answer. You do not need to show work but limited partial credit may be available for work shown.

- a. [2 points] If  $f(x) = 3x - 5$ , then the function  $f(x) + a(x)$  must be linear.

TRUE

FALSE

- b. [2 points] If  $f(x) = 3x - 5$ , then the function  $f(x) \cdot a(x)$  must be linear.

TRUE

FALSE

Also define the function  $q(x) = x^2 + 3$ .

- c. [3 points] If  $a(q(x)) = \frac{1}{3}x^2$ , find the values of  $m$  and  $b$ . **Show all work.**

*Do not use these values of  $m$  and  $b$  for the other parts of this problem.*

$m =$  \_\_\_\_\_

$b =$  \_\_\_\_\_